

WHAT IS CLAIMED IS:

1. An image recognition method comprising:
obtaining a deformed image by deforming a captured
range image; and

5 recognizing three-dimensional motion of an object
in the range image by comparing the obtained deformed
image with a newly captured range image.

2. An image recognition method comprising:
obtaining a deformed image by deforming a captured
range image; and

10 recognizing the presence/absence of three-
dimensional motion of an object in the range image by
comparing the obtained deformed image with a newly
captured range image, and recognizing a series of
15 motions recognized from each of a series of a plurality
of range images.

3. A method according to claim 2, further
comprising predicting motion of the object on the basis
of the series of recognized motions.

20 4. A method according to claim 1, further
comprising predicting motion of the object on the basis
of a feature amount of the object extracted from the
captured range image.

25 5. A method according to claim 2, further
comprising predicting motion of the object on the basis
of a feature amount of the object extracted from the
captured range image.

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6. A method according to claim 2, further comprising predicting motion of the object on the basis of a feature amount of the object extracted from the captured range image, and the series of recognized motions.

7. A method according to claim 1, further comprising the step of compressing a range image captured by image capture unit on the basis of the recognized motion of the object.

8. A method according to claim 2, further comprising compressing a range image captured by image capture unit on the basis of the recognized motion of the object.

9. An image recognition apparatus comprising:
an image capture unit configured to capture a range image;

an image deformation unit configured to deform the range image captured by said image capture unit; and

a recognition unit configured to recognize three-dimensional motion of an object by comparing a deformed image obtained by said image deformation unit and a new range image captured by said image capture unit.

10. An image recognition apparatus comprising:
an image capture unit configured to capture a range image;

an image deformation unit configured to deform the range image captured by said image capture unit;

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a storage unit configured to store the range image captured by said image capture unit;

an image deformation unit configured to deform a designated range image of the range image captured by said image capture unit and/or the range image stored in said storage unit;

a first recognition unit configured to recognize three-dimensional motion of an object by comparing one of a deformed image obtained by said image deformation unit and the range image stored in said storage unit, and a new range image captured by said image capture unit; and

a second recognition units configured to recognize a series of motions recognized from each of a series of a plurality of range images by said first recognition unit.

13. An apparatus according to claim 10, further comprising:

a prediction unit configured to predict motion of the object on the basis of the series of motions recognized by said second recognition unit.

14. An apparatus according to claim 11, further comprising:

a prediction unit configured to predict motion of the object on the basis of the series of motions recognized by said second recognition unit.

15. An apparatus according to claim 12, further

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comprising:

a prediction unit configured to predict motion of the object on the basis of the series of motions recognized by said second recognition unit.

5 16. An apparatus according to claim 9, further comprising:

a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

10 a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit.

17. An apparatus according to claim 10, further comprising:

15 a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

20 a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit.

18. An apparatus according to claim 11, further comprising:

25 a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

a prediction unit configured to predict motion of the object on the basis of the feature amount extracted

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by said feature amount extraction unit.

19. An apparatus according to claim 12, further comprising:

5 a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit.

10 20. An apparatus according to claim 10, further comprising:

a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

15 a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit, and the series of motions recognized by said second recognition unit.

20 21. An apparatus according to claim 11, further comprising:

a feature amount extraction unit configured to extract a feature amount of the object from the range image a captured by said image capture unit; and

25 a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit, and the series of motions recognized by said second recognition unit.

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22. An apparatus according to claim 12, further comprising:

a feature amount extraction unit configured to extract a feature amount of the object from the range image captured by said image capture unit; and

a prediction unit configured to predict motion of the object on the basis of the feature amount extracted by said feature amount extraction unit, and the series of motions recognized by said second recognition unit.

23. An apparatus according to claim 9, further comprising:

an image compression units configured to compress the range image captured by said image capture unit on the basis of the recognized motion of the object.

24. An apparatus according to claim 13, further comprising:

an image compression unit configured to compress the range image captured by said image capture unit on the basis of the recognized motion of the object.

25. An apparatus according to claim 11, further comprising:

an image compression unit configured to compress the range image captured by said image capture unit on the basis of the recognized motion of the object.

26. An apparatus according to claim 12, further comprising:

image compression unit configured to compress the

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range image captured by said image capture unit on the basis of the recognized motion of the object.

27. An article of manufacture comprised of a computer-usable medium having computer-readable program code means that implements computer-readable program code means for recognizing an image, comprising:

computer-readable program code means for making a computer capture a range image;

computer-readable program code means for making the computer deform the range image captured by the image capture means; and

computer-readable program code means for making the computer recognize the presence/absence of three-dimensional motion of an object by comparing a deformed image obtained by the image deformation means and a new range image captured by the image capture means.

28. An article of manufacture comprised of a computer-usable medium having computer-readable program code means that implements computer-readable program code means for recognizing an image, comprising:

computer-readable program code means for making a computer capture a range image;

computer-readable program code means for making the computer deform the range image captured by the image capture means;

computer-readable program code means for making the computer recognize the presence/absence of

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three-dimensional motion of an object by comparing a deformed image obtained by the image deformation means and a new range image captured by the image capture means; and

- 5 computer-readable program code means for making the computer recognize a series of motions recognized from a series of a plurality of range images by the recognition means.

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